

## REMARKS

Claims 22-35 and 42-47 are pending in this application. Claims 22-35 and 42-47 stand rejected in a non-final Office Action mailed on October 3, 2008. Each of the pending claim rejections is addressed and rebutted in detail below. The Examiner's attention is further drawn to the Declaration of Harmannus Franciscus Maria Schoo made under 35 U.S.C. § 1.132 which is filed herewith and incorporated herein in its entirety. The Declaration of Dr. Schoo includes substantial evidence presented in rebuttal of the pending claim rejections.

### **I. Claim Rejections – 35 U.S.C. § 112**

Claims 42 and 43 stand rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. The Examiner states that the limitation of Claim 42 “wherein the detector comprises at least one photo diode for each of said channels” is not supported in the originally filed specification for the limitation, “for each of said channels.” Thus, the Examiner contends that the limitation “for each of said channels” is new matter. Claim 43 is rejected for being dependent upon a rejected base claim. Applicant respectfully disagrees with the pending § 112 rejection of Claims 42 and 43.

In the International Application as published at page 18, lines 18-20 it is stated, “the sensor in Figs. 3a-3g is formed by one or more LEDs reference numeral 1, photo diodes 2 for measuring detection signal and reference signal...” (emphasis added) In addition at page 20, lines 5-6, it is stated, “in such use the detection signal and the reference signal can both be directed at a composition to be analyzed, for instance a selective coating...” See also, page 20, lines 24-26 where it is stated, “the invention further relates to the use of a single light source for generating a reference signal and a detection signal in a detector, in particular, in a sensor...”

Based upon the foregoing, it is clear the applicant has fully described a detector which can receive both a reference signal and a separate detection signal. The use of the word “channel” to describe the path through which individual signals are input to an electronic device is commonplace and well understood in the electronic arts. For example, it is typical to describe a television set as receiving multiple “channels,” each of which “channel” corresponds to a distinct input television signal. Applicant respectfully submits that one skilled in the electronic arts would know that the “for each of said channels” language of Claim 42 unambiguously relates to the recited detector's ability to receive at least a distinct detection signal and reference signal as described throughout the specification as filed and recited in Claim 22, from which

Claim 42 depends. Accordingly, applicant respectfully requests that the rejections of Claims 42 and 43 pursuant to 35 U.S.C. § 112 be withdrawn.

## **II. Claim Rejections – 35 U.S.C. § 102**

Claims 22-34 and 47 stand rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, obvious over Yu et al. (U.S. Patent Application Publication No. 2002/0017612). As described in detail below, applicant respectfully submits that the anticipation rejection should be withdrawn since Yu et al. does not show or teach each element of the rejected claims. Similarly, applicant respectfully submits that the obviousness rejection over Yu et al. should be withdrawn since Yu et al. does not suggest each of the claimed elements and furthermore, certain claim elements as described in detail below were not previously within the knowledge of one skilled in the art.

Claim 22 is an independent claim. Claims 23-34 and 47 each depend from Claim 22. Claim 22 recites, among other elements;

“A detection system comprising:

a light emitting diode comprising at least one semiconductive electroluminescent active layer which provides for the simultaneous emission of at least two intensity maxima of different wavelengths of light from the active layer and the active layer comprises at least one electroluminescent organic compound...”

As will be discussed in detail below, the above quoted language appropriately limits the scope of the claim and fully distinguishes the claimed embodiment from Yu et al. As an initial matter, however, Applicant submits that the pending 35 U.S.C. § 102(b) and § 103(a) rejections of Claim 22 and the claims which depend therefrom must be withdrawn since Yu et al. teaches no LED of any kind.

The Examiner argues at the bottom of page 3 of the pending Office Action that Figure 1 of Yu et al. discloses an LED. This is incorrect. As is fully described in paragraphs 2-7 of Dr. Schoo's attached Declaration, no LED is shown on Figure 1 or described in the Yu et al. reference. The arrows shown on Figure 1 of Yu et al. representing light clearly point toward the detector active layer not away from it. The Examiner is confusing Yu's light receiving detector structure with a light emitting LED. In summary, the referenced Yu structure is not an LED and can not function as an LED. Therefore, the pending rejections of claim 22 and the claims depending from claim 22 are not appropriate.

Furthermore, the Examiner states at the bottom of page 3 of the Office Action that “it is inherent that a detector comprises a signal channel and a separate reference channel since these parts are essential for the intended use of a detector.” Applicant respectfully disagrees. As noted in paragraph 8 of the Schoo Declaration, image sensors as recited in the Yu et al. reference do not require a reference channel in order to function.

The rejection of Claim 22 must be withdrawn because Yu et al. shows no LED. In addition, Yu certainly does not show or suggest the particular LED claimed by Applicant when all recited limitations are considered. In the first paragraph of page 4, the Examiner argues that the following recitation of Claim 22; “provides for the simultaneous emission of two intensity maxima of different wavelengths of lights from the active layer” merely specifies an intended use and has thus been treated as non-limiting. Applicant respectfully disagrees. The intended use of the claimed device is appropriately contained in the preamble of Claim 22. The use of the device is as a “detection system.” The recited limitation concerning the simultaneous emission of at least two intensity maxima at different wavelengths of light is not an intended use. On the contrary, this recitation is an appropriate functional limitation which properly limits the scope of all claims. For example, a detector having an LED which produces light only having one intensity maximum would clearly fall outside of the scope of Claim 22 and the claims which depend therefrom.

Functional language such as employed in Claim 22 describing the LED element is an appropriate additional limitation in a claim. See *K-2 Corp. v. Salomon S.A.* 191 F.3d 1356, 1636, 52 USPQ2d 1001, 1004 (Fed. Cir. 1999). See also MPEP § 2173.05(g) where it is stated:

*“There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. In re Swinehart, 439 F.2d 210, 169 USPQ 226 (CCPA 1971).*

*A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step.”*

Accordingly, applicant respectfully submits that the limitation “provides for the simultaneous emission of at least two intensity maxima of different wavelengths of light

from the active layer” is a proper functional limitation on claim scope which must be considered by the Examiner.

The Examiner further states that applicant’s functional language is treated as non-limiting since, “it has been held that in device claims the device must distinguish from the prior art in terms of structure rather than function.” The Examiner cites *In re Schreiber*, 128 F.3d 143, 1477-78, 44 USPQ 2<sup>nd</sup> 1429, 1431-32 (Fed. Cir. 1997) to support this proposition. Applicant respectfully submits that the Examiner’s reliance on *Schreiber* is incorrect in this case. In the *Schreiber* matter, the cited prior art disclosed structure identical to the *Schreiber* claim. In particular, the cited prior art disclosed a “dispensing top” that has a “generally conical shape and opening at each end.” The *Schreiber* appellant merely argued that although the prior art disclosed the same structure, it did not disclose that the structure could be used to dispense popcorn from an open ended popcorn container. Thus, *Schreiber* tried to distinguish an identical apparatus by stating that the claimed function was not recited in the prior art.

The rule of law supporting the *Schreiber* conclusion can be shown to be inapplicable in the present case. Applicant’s functional language concerns an LED element, which must “provide for the simultaneous emission of at least two intensity maxima of different wavelengths of light from the active layer.” As detailed in paragraphs 3-14 of Dr. Schoo’s Declaration, the structure relied upon by the Examiner from Yu et al. is not an LED at all and is not capable of emitting any light whatsoever, much less light having two intensity maxima. As described above and in the attached Declaration, the Yu et al. apparatus can only generate current in response to light from an external source. Accordingly, Applicant respectfully submits that two firm conclusions may be drawn:

- a. The element of Claim 22, “provides for the simultaneous emission of at least two intensity maxima of different wavelengths of light from the active layer,” is an appropriate functional limitation; and
- b. The Yu et al. reference does not teach or suggest any light emitting structure. Furthermore, the Yu et al. reference does not teach or suggest the particular light emitting structure recited in Claim 22.

At pages 5-6 of the Office Action, the Examiner cites certain additional reasons why dependent Claims 23-33 are anticipated by Yu et al. In particular, the Examiner refuses to accord proper limiting weight to the functional language of Claims 25 and 26. Applicant respectfully submits that Claims 25 and 26 are allowable for the reasons discussed in detail above.

The Examiner also indicates with respect to Claims 29-33 that Yu et al. shows the emission of at least two intensity maxima and the differences between them. The Examiner cites Figures 15a-15c of the Yu et al. reference in support of his position. As described in detail in the School Declaration, Yu et al. does not disclose or suggest a device which is capable of emitting light. Therefore, it is impossible that Yu et al. shows the emission of at least two intensity maxima. Furthermore, as is detailed in paragraphs 12-14 of the Declaration, neither Figure 15a, 15b or 15c of the Yu et al. reference shows an emission spectra. On the contrary, Figures 15a-b show the spectral response of a photodiode when illuminated by an external light source. In the case of Figure 15c, the transmittance spectra of selected pixels are illustrated. Applicant respectfully submits that the figures relied upon by the Examiner fail to show any emission characteristics whatsoever.

### **III. Claim Rejections – 35 U.S.C. § 103**

Claims 22-34 and 47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Burroughes (GB 234034) in view of Capasso et al. (U.S. Patent No. 6,278,134). Burroughes is cited for the teaching of an organic LED. Capasso is cited for the teaching of a two channel detector. The Examiner argues that the rejected claims teach this combination of elements, and thus concludes that the pending claims are obvious.

The Supreme Court recently addressed the issue of obviousness in *KSR International Co. v. Teleflex, Inc.* 550 U.S. \_\_\_, 82 USPQ2d 1385 (2007). With respect to the obviousness of a combination of elements the Court in *KSR* recognized the importance of identifying "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed invention does," reasoning that:

“Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.”

The Examiner cites no reason or rationale why one skilled in the art would combine Burroughes with Capasso et al. to arrive at the claimed detector. Furthermore, it is clear from a close reading of the Capasso et al. reference that the combination of Burroughes and Capasso et al. would not function as recited in the pending claims. It is apparent from Figure 7 of the Capasso et al. reference and the text describing Figure 7 at column 9, line 30, that the Capasso et al. detector does not include separate signal and reference channels which may operate simultaneously (as required by Claim 22). On the contrary, Capasso et al. discloses a sensor receiving input from a cascade semiconductor laser capable of operation under either a positive or negative applied bias voltage. Thus, the light source of the Capasso et al. device is “bi-directional” and may emit laser energy at either a  $\lambda^+$  or  $\lambda^-$ . See, for example, column 2, line 49 of the Capasso et al. reference.

It is impossible to apply both a positive bias supply voltage and a negative bias supply voltage to the Capasso et al. laser simultaneously. Thus, the two wavelengths emitted by the Capasso et al. device must be emitted in an alternating manner. Accordingly, the Capasso et al. sensor would probably not function when combined with an organic LED emitting light simultaneously at two intensity maxima. As noted above, the Burroughes reference does not teach a detector of any type. Capasso et al. does teach a detector, however it is a detector configured to receive input from a bi-directional light source which does not and can not provide light having two simultaneous peaks to a detector.

The Supreme Court addressed combinations such as that advocated by the Examiner in the KSR opinion. For example, the KSR majority stated; “when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be non-obvious.” The Supreme Court also reaffirmed

that when two known elements which form the claimed combination “cannot be combined [in view of the known prior art]...in the manner described” in the claim, the combination is likely to be non-obvious.

With respect to the pending obviousness rejection, the Examiner at page 7 of the Office Action states that the functional limitation, “provides for the simultaneous emission of at least two intensity maxima of different wavelengths of light from the active layer” is merely a field of intended use or non-limiting functional language. As argued in detail above, applicant submits that this language is properly limiting on the scope of all pending claims.

Claims 22-35 and 47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hatwar (EP 1286569) in view of Capasso et al. This obviousness rejection is similar to that discussed in detail above in that Hatwar discloses a light emitting diode and Capasso et al. is relied upon for the teaching of a multiple channel detector. Applicant respectfully submits that Claims 22-35 and 47 are allowable for the reasons discussed above with respect to Burroughes and Capasso et al.

Claims 44-46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yu et al. as applied to Claim 22 and further in view of Dickert et al. Dickert et al. is relied upon to disclose a coating for polar and non-polar vapors in a sensor device. Claims 44-46 depend from Claim 22. These claims should be allowed because neither Yu et al. nor Dickert disclose an LED of any type as discussed in detail above.

Claims 44-46 stand further rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Burroughes, Capasso et al. and Dickert et al. Applicant respectfully submits that Claims 44-46 are allowable over these references for the reasons set forth in detail above.

Claims 44-46 stand further rejected as being unpatentable over Hatwar in view of Capasso et al. and further in view of Dickert et al. Applicant respectfully submits that Claims 44-46 are allowable over these references for the reasons set forth in detail above.

Accordingly, Applicant respectfully submits that the claims as pending are allowable over the prior art references relied upon by the Examiner.

If it would be helpful to obtain favorable consideration of this case, the Examiner is encouraged to call and discuss this case with the undersigned.

This constitutes a request for a one-month extension of time and an authorization to charge all fees therefore to deposit account No. 19-5117, if not otherwise specifically requested. The undersigned hereby authorizes the charge of any fees created by the filing of this document or any deficiency of fees submitted herewith to be charged to deposit account No. 19-5117.

Respectfully submitted,

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